



PUTTING RESEARCH TO WORK

## BRIEF

# Driver Perceptions of Variable Message Signs

Drivers need accurate information to make decisions about departure times and travel routes. To help convey this information, the Wisconsin Department of Transportation uses portable variable message signs throughout the state, and permanent VMS in areas where traffic is heaviest. These electronic signs feature changeable messages that display information about road and traffic conditions, including travel times, traffic accidents and lane closures.

## What's the Problem?

VMS systems have a significant impact on Wisconsin roadway efficiency, with benefits such as increased arrival time certainty, stress reduction and time savings. However, WisDOT has lacked a qualitative and quantitative evaluation of these benefits and of public perception of the signs. An in-depth evaluation would provide valuable information for optimizing existing signs and designing and deploying additional systems.

## Research Objectives and Methodology

Researchers at the University of Wisconsin-Madison conducted a survey of Wisconsin drivers to assess their opinions on state travel conditions, their knowledge of general freeway issues, and their awareness and perception of VMS and ramp meters. A key goal was to gather information about VMS performance that could be used to support future deployment decisions in Wisconsin.

During December 2001, 500 surveys were sent to drivers in 22 Wisconsin counties. Researchers targeted VMS and ramp meter users by selecting counties along major freeways (I-39, I-43, I-90 and I-94). To encourage participation, two first-class stamps were enclosed with the survey, along with a letter explaining the survey's intent and its importance to Wisconsin drivers. In all, 221 surveys were completed, returned and analyzed—a response rate of 51.6% once incorrect addresses were excluded.

## Results

The survey yielded information on drivers' perceptions of both traditional aspects of highway travel and the use of intelligent transportation systems devices like VMS and ramp meters. (Respondents' experiences with ramp meters are addressed in a separate report, available at <http://www.dot.wiscn.gov/library/research/reports/its.htm>.) The survey also provided insights into drivers' behavior in the face of traffic congestion. Survey results included:

- Forty percent of the respondents were very familiar with VMS, and 69.6% have VMS on their regular travel routes.
- Drivers believe VMS systems improve freeway safety, save driving time, and are useful for reporting weather and traffic conditions. Their responses were mixed on whether the signs reduce driver stress.
- Motorists feel that information displayed on VMS is somewhat reliable.
- Respondents would like to see more current messages displayed, as well as more information regarding alternate routes and whether they offer travel time savings.
- Drivers were very concerned about the blockage of VMS displays by other traffic.

In general, respondents seem satisfied with Wisconsin's freeways. Their highest priorities are maintaining ride quality (comfort) and overall pavement condition, ensuring prompt emergency responses, and reducing traffic congestion. In addition, respondents would like more lanes constructed and stricter speed enforcement, and they noted that reflective pavement markings are sometimes difficult to see.

### Investigator



*"This research will lead to improved placement, efficiency and effectiveness of VMS in Wisconsin."*

—Bin Ran  
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Wisconsin-Madison  
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#### Project Manager



*"This was a comprehensive study that will enable WisDOT to effectively address customer expectations for incident management systems."*

—John Corbin

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VMS displays relay information about upcoming road and traffic conditions. In a survey of Wisconsin drivers, most respondents were familiar with the signs, and said traffic congestion information displayed on VMS would be helpful to them.

## Implementation

Based on the concerns expressed by the drivers surveyed, researchers made several recommendations to improve VMS implementation:

- WisDOT should develop more messages related to specific traffic conditions for inclusion on VMS displays.
- Messages should be composed in accordance with national standards, and should include more information on alternate routes.
- WisDOT should coordinate message development with other agencies to reach a consensus on message deployment, standard message formats and abbreviations.
- To address drivers' concerns about VMS visibility, WisDOT should develop uniform VMS field installation guidelines to provide information on site selection and roadway and traffic factors. These guidelines should address the placement of both permanent and portable VMS systems.

## Benefits

The results of this survey will help WisDOT improve the quality and availability of traveler information, and will inform the agency's decisions about improving and expanding VMS technology. Optimized VMS systems will benefit drivers in improved travel times and arrival time certainty.

The final report will be made available for use by other state DOTs as an aid in deploying similar VMS and ramp meter systems. The report includes a sampling of respondents' comments related to VMS, ramp meters and other aspects of highway travel, which gives WisDOT and other agencies a window into the concerns of the driving public, articulated in their own voices.

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